## Amendments to the Specification

**Please replace the paragraph beginning at page 7, line 17, with the following rewritten paragraph:**

Another aspect of the present invention is directed to an obstacle detection device to be mounted on a vehicle for detecting and displaying an obstacle in a vicinity of the vehicle, the device including: an obstacle detection section for emitting beams having a predetermined divergence angle consecutively in a plurality of different directions, receiving a reflected wave from an obstacle for each direction, and detecting the obstacle existing within an emission angle of the beam for the direction; a distance calculation section for calculating a distance representative of an interspace between the obstacle and the vehicle for each direction based on a received signal of the reflected wave for the direction outputted from the obstacle detection section; an obstacle data calculation section for calculating a location of the detected obstacle based on the direction in which the beam is emitted and the distance calculated by the distance calculation section; a shape data matching section, in which shape data for representing the shape of an obstacle to be detected is previously inputted, for calculating a location and orientation of the obstacle to be detected in relation to the vehicle by comparing the shape data with obstacle data calculated by the obstacle data calculation section; an obstacle image creation section for creating, based on the shape data of the obstacle to be detected and the location and orientation calculated by the shape data matching section, a target obstacle image in which the location and orientation of ~~the shape of~~ the obstacle to be detected is changed, and generating image data for displaying the target obstacle image; and a display section for receiving the image data generated by the obstacle image creation section and displaying an image illustrating a positional relationship between the obstacle and the vehicle.

**Please replace the paragraph beginning at page 13, line 18, with the following rewritten paragraph:**

FIG. 33 is a diagram illustrating exemplary best coinciding ~~direction~~ shape points detected in the fifth embodiment of the present invention.

**Please replace the paragraph beginning at page 17, line 18, with the following rewritten paragraph:**

Once the direction data is outputted from the control section 13, the transmission section 111 outputs, to the antenna 113, a transmission signal and a direction control signal for emitting a beam in the direction indicated by the direction data, whereby it emits the beam. In addition, the transmission section 111 outputs the transmission signal to the distance calculation section 12 (step S102). The reception section 112 receives the reflected wave of the beam emitted at step ~~S302~~ S102, and outputs a received signal to the distance calculation section 12 (step S103).

**Please replace the paragraph beginning at page 20, line 19, with the following rewritten paragraph:**

With reference to FIG. 4 again, the distance from the antenna 113 to the obstacle SC calculated by the distance calculation section 12 as described above is explained specifically. Because the beam BM emitted from the antenna 113 is reflected at numerous points of the wall surface WL situated within the irradiation range thereof, reflected waves from various points of the wall surface WL ranging from the point closest to the antenna 113 and the point farthest from the antenna 113 are received in congregation. The distance D, calculated as described above based on a received signal of such reflected waves, corresponds to an average value between the distance from the antenna 113 to the closest point of the wall surface WL and the distance from the antenna 113 to the farthest point of the wall surface WL. An arc RC illustrated in FIG. 4 represents ~~the distance D calculated in the above-described manner using~~ an arc which, out of a circumference centered around the antenna 113 with a radius equal to the distance D as calculated in the above-described manner, falls within an angular range in which the beam BM has been irradiated.

**Please replace the paragraph beginning at page 21, line 12, with the following rewritten paragraph:**

By thus calculating a distance to the obstacle SC with respect to each direction in which a beam BM is emitted, the location of the obstacle SC existing in the vicinity of the vehicle is detected. Here, the narrower the beam divergence angle is, the more limited the angular range ~~RC~~ within which the detected obstacle SC can be situated becomes, so that the location of the obstacle SC can be determined more precisely. On the other hand, the wider a divergence angle the beam BM has, the more roughly the location of the obstacle SC is detected. Moreover, given the same divergence angle of the beam BM, the irradiation range of the beam BM becomes narrower as the distance from the antenna 113 to the obstacle SC becomes shorter. Consequently, the shorter the distance from the antenna 113 to the obstacle SC is, the more precisely the location of the obstacle SC can be detected. On the other hand, the longer the distance from the antenna 113 to the obstacle SC is, the more roughly the location of the obstacle SC is detected.

**Please replace the paragraph beginning at page 23, line 15, with the following rewritten paragraph:**

Next, the obstacle image creation section 14 draws at least one "obstacle presence line" $L_{SC}$ based on each of ten sets of direction data and distance data stored in the control section 13 (step S202). The obstacle presence line $L_{SC}$ is an exemplary obstacle image in the present embodiment, corresponding, for example, to the arc RC shown in FIG. 4, and indicates a detected location of the obstacle with respect to each one of the irradiation directions of the emitted beams BM. More specifically, for each piece of direction data and the corresponding piece of distance data thereof, the obstacle image creation section 14 draws an arc centered around the location $P_{AT}$ of the antenna (i.e., the origin), with the distance data defining its radius and the arc extending over an angular range of about 16° having a center-line direction indicated by the direction data. For example, the obstacle presence ~~location~~ line $L_{SC}$ shown in FIG. 7 is an

obstacle presence line in the case where the direction data is $\theta_1$ and the distance data is $D_1$. After the above-described step S202, the process proceeds to the next subroutine step S108 (see FIG. 3).

**Please replace the paragraph beginning at page 24, line 8, with the following rewritten paragraph:**

At step S108, the obstacle image creation section 14 draws a line segment representing the shape of the detected obstacle. FIG. 8 is a flowchart showing the subroutine process of step S108. Based on both of the direction data and the distance data, the obstacle image creation section 14 calculates coordinates of a point (hereinafter referred to as an "obstacle detection point") $P_{SC}$ that indicates a detected location of the obstacle (step S301). For example, the point $P_{SC}$ illustrated in FIG. 7 is an obstacle detection point of the obstacle in the case where the direction data and the distance data are $\theta_1$ and $D_1$, respectively. In this case, the coordinates of the point $P_{SC}$ are $(x, y)=(D_1 \sin\theta_1, D_1 \cos\theta_1)$. The obstacle image creation section 14 draws a kinked line ~~CL~~ joining the coordinates of obstacle detection points $P_{SC}$ calculated at step S301 one after another (step S302). After the process of the above-described step S302, the operation of the obstacle detection device returns to the main routine shown in FIG. 3.

**Please replace the paragraph beginning at page 27, line 25, with the following rewritten paragraph:**

Next, with reference to FIG. 11, an operation of the obstacle image creation section 14 is described with respect to the differences from that in the first embodiment. FIG. 11 is a flowchart showing the operation of the present obstacle image creation section 14. The flowchart of FIG. 11 is identical to the flowchart according to the first embodiment (see FIG. 6) except that the process of step S102 is replaced by step S403 and that the process of step S402 is added. Therefore, among the steps shown in FIG. 11, the description of any step identical to that in FIG. ~~3~~ 6 is omitted.

**Please replace the paragraph beginning at page 29, line 20, with the following rewritten paragraph:**

FIGS. 12A and 12B and FIGS. 13A and 13B illustrate obstacle images created by the present obstacle image creation section 14. Although in each of these figures, a line corresponding to the external shape of the real obstacle is shown by a dotted line for the sake of mutual comparison, note that the dotted line is not drawn in an actual obstacle image. Compared with the obstacle images in the first embodiment, these obstacle images are characterized in that the obstacle presence ~~location~~ lines for obstacles whose distance from the vehicle is shorter are drawn in progressively thicker lines. From these figures, it is apparent that those obstacle presence lines $L_{SC}$ whose distance from the vehicle is shorter are modified so that the thickness of such obstacle presence lines (arcs) become progressively thicker, whereby the displayed obstacle presence lines $L_{SC}$ become more emphasized.

**Please replace the paragraph beginning at page 32, line 2, with the following rewritten paragraph:**

Note that it has been assumed in the present embodiment that based on the distance from the vehicle, the thickness of the ~~vehicle~~ obstacle presence line $L_{SC}$ is changed. Alternatively, it may be so arranged that the color of the obstacle presence line $L_{SC}$ is changed. This allows the obstacle detection device to display obstacle presence lines $L_{SC}$ so as to look more emphasized as the distance thereof from the vehicle becomes shorter, as in the case where the thickness of the obstacle presence line $L_{SC}$ is changed.

**Please replace the paragraph beginning at page 34, line 14, with the following rewritten paragraph:**

The coordinates of the center K of the ellipse are obtained in the following manner. The triangle $\Delta$HIK in FIG. 15 is a right-angled triangle whose hypotenuse HI has a length of ~~D1~~ $\underline{D_1}$, and whose internal angle $\angle$IHK is about 8°. Therefore, the length of the side HK is $D_1 \cos 8°$.

That is, because point K is a point whose direction seen from the antenna is $\theta_1$ and whose distance from the antenna is $D_1 \cos 8°$, the coordinates of the center K of the ellipse are expressed as $(x, y)=(D_1 \cos 8° \sin\theta_1, D_1 \cos 8° \cos\theta_1)$.

**Please replace the paragraph beginning at page 37, line 11, with the following rewritten paragraph:**

Next, with reference to FIG. 18, an operation of the present obstacle image creation section 14 is described with respect to the differences from that in the ~~second~~ third embodiment. FIG. 18 is a flowchart showing the operation of the present obstacle image creation section 14. The flowchart shown in FIG. 18 is identical to the flowchart according to the third embodiment (see FIG. 14) except that the process of step S504 is replaced by the processes of step S604 and step S605. Therefore, among the steps shown in FIG. 18, the description of the steps identical to those in FIG. 14 is omitted.

**Please replace the paragraph beginning at page 47, line 11, with the following rewritten paragraph:**

At step S902, the shape data matching section 18 calculates, based on the direction data and the distance data stored in the control section 13, the coordinates of obstacle detection points P and interpolated points P' which are interpolated between two obstacle detection points P at a predetermined ~~range~~ interval, and obtains obstacle vectors *b* for showing the shape of the detected obstacle, based on the coordinates of the calculated obstacle detection points P and the interpolated points P' (step S902).

**Please replace the paragraph beginning at page 52, line 7, with the following rewritten paragraph:**

Next, the shape data matching section 18 detects coordinates on the obstacle image at which the best coinciding shape points Q detected at step S905 best coincide with the obstacle

detection points P (step ~~S907~~ S906). An operation at step ~~S907~~ S906 of the shape data matching section 18 is described more specifically. First, the shape data matching section 18 shifts the coordinates of all best coinciding shape points Q so that the coordinates of the obstacle detection point $B_1$ and the coordinates of the shape point $C_1$ coincide with each other; pairs the obstacle detection points P and interpolated points P' with the best coinciding shape points Q in regular order; and calculates a reciprocal (hereinafter referred to as a "location coincidence degree R") of the sum total of distances between two points that are paired.